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PATENT APPLICATION

Applicants Docket No.: MSD01

APPLICATION FOR

UNITED STATES UTILITY PATENT

TO ALL WHOM IT MAY CONCERN:

Be it known that we, **Robert H. Murray** and **John R. Murray**, citizens of the United States of America, residing at 52 Manor Hill Drive, Fairport; New York 14450, State of New York and County of Monroe, have invented a

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A SAFE TOY BALLOON CLOSURE AND SEALING DEVICE AND ASSEMBLIES USING SAME

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This Application is based on a Provisional Patent Application No. 60/431,136 filed 12/05/2002.

Related Applications

This application is related to U.S. Provisional Application Serial No. _____ (Applicant's Docket MSD02), entitled "SAFER TOY BALLOONS AND METHODS FOR IMPARTING UNPALATABLE TASTE TO SAME" having a common inventor and filed herewith on the same day.

Field of the Invention.

This invention relates to closure devices, and more particularly to a safe toy balloon closure and sealing device for closing and sealing an inflated elastometric toy balloon having an elastic balloon neck, without a need of tying the balloon neck, and reduce a risk of ingestion injury from balloons.

The invention also relates methods for adapting and utilizing bag closure devices, commonly used with inelastic bags, to effectively close and seal a toy balloons, and improvements thereto.

Embodiments of the device additionally include such a device made to meet the standard safety test for small parts, one made safe by imparting a revolting taste thereto, one in an assembly including an attaching tether, another by interconnecting multiple devices, another connected to a supporting line, and another adapted for use as a punch ball game.

Background of the Invention.

It is well known that toy balloons have been the leading cause of death from toys in the hands of young children. For example, according to the U.S. Consumer Product Safety Commission data, in a ten-year period ending October 2002, there were 81 deaths and an additional 118 toy balloon injury incidents that required medical treatment. The data does not reflect the number of deaths and injuries, which involved toy balloon closure and sealing devices.

It is common knowledge however that young children, especially those three years of age and under, are ordinarily inclined to place small objects they find into their mouth. If the objects are small, sharp or breakable there is the possibility for injury or even death, principally by choking. Toy balloon closure and sealing devices usually are made from structured members that are small, sharp and breakable, and hence they pose a risk for injury or even death, principally by choking. In order to make such small objects, particularly toy objects safe, there is, for example, a standardized choke test that such parts to be safe must meet or pass. One test apparatus for this choke test consists of a vertical tube 1-1/4 inch in diameter and 2-1/4 deep with a partition extending upward at a 45-degree angle from a bottom corner of the tube. A small part, placed within the tube, is safe and suitable for use by children of all ages if any portion of the part projects above the top of the tube.

Background and prior art.

Generally, closure and sealing devices are well known and include bag closure devices for closing and sealing uninflated flexible film bags such as those used for containing bread and other produce items, as well as conventional toy balloon closure devices for closing and sealing inflated toy balloons.

One example of prior art is for A Balloon neck closure and decoration device, US Pat. No 5,799,377 (Carroll et al.) which describe a generally flat circular closure disk with two or three inwardly extending slots for holding the neck of the balloon. The preferred device described in this disclosure has but one balloon neck

passage means or slot so as to avoid confusing the user, and as will be described later, balloon neck passage begins and ends in the same single passage means making a complete revolution to do so (best seen in Fig. 12). In the Carroll patent, Fig 1 and Fig. 2 show the balloon neck threaded through each of the three slots in turn and exiting from a different slot than the entry point. This action has been found to be awkward since fingers holding the device will always be covering at least one of the yet-to-be-threaded slots and requires added dexterity. The applicant's device may be easily grasped without blocking the neck wrapping path as will be shown.

Examples of bag closure devices for closing and sealing uninflated flexible film bags are disclosed for example in U.S. Pats. Nos. 4,361,935 (Paxton), 4,509,231 (Paxton), 4,333,566 (Holmes), in which each variably includes a relatively large holding aperture for containing and retaining an inserted neck of such a flexible film bag. Such devices are manufactured by Kwik Loc ® Corporation Yakima, WA, in a wide variety of styles for closing net bags as well as uninflated film bags. All of the Kwick Loc ® closure products appear devoted to holding bags closed and make no attempt to seal the bags against fluid escapement, for example helium used in inflating toy balloons. In fact, tightly sealing such bags would be a distinct disadvantage for the intended purpose of containing bread, vegetables and the like, creating unnecessary bulk due to air entrapment. Such bag closure devices, when used for uninflated plastic film bags with one pass through a neck retaining aperture do effectively gather and secure bag closure as intended but are unsuited for effectively closing and sealing the elastic necks of toy balloons that are inflated with an easily escapable fluid such as helium, air or the like. . The result is fluid escaping between folds in the gathered balloon neck walls causing rapid premature deflation of the inflated toy balloon.

Examples of conventional toy balloon closure and sealing devices for closing and sealing toy balloons include molded and relatively heavy plastic devices with containment holes and/or slots for inserting and containing a twisted elastic neck of a toy balloon. For example, one such device is a molded plastic disk marketed

under the trade name SAFETITE® DISK by Premium Balloon Accessories, Inc. of Sharon Center, Ohio, and shown in US Pat. No. D359,229 (Jules) and having two containment holes and two insertion slots, are available commercially as shown in Figs. 7 and 8.

One of the two slots is longer than the other slot and the two holes are not symmetric relative to the circular periphery of the disk. User's instructions describe the slots in terms of longer and shorter, and therefore require the user to decide which of the slots is longer and would allow the neck of the balloon to sit at the center of the disk. The Patent drawings show a total of four slots which would likely have contributed to additional user confusion had they been included. Even when this conventional device is used properly according to such instructions, there is still quite a high risk of the elastic twisted neck of the toy balloon unraveling and resulting in premature deflation of the inflated toy balloon. Further explanation is provided with the detailed description of prior art Figs. 7 and 8.

Another product distributed by Premium Balloon Accessories is a small diameter flat disk having a single central hole. To use it, a croquet-hook like rod is needed to stretch and pull a twisted loop of balloon neck through the hole. The neck is thereby doubled back upon itself. The hook is removed releasing much of the tension. This causes the neck to expand and effectively prevents the loop from passing backwards though the hole. Unfortunately, the release of tension allows for slight gaps in the folds in the balloon neck creating the risk of fluid leakage. Although widely used in the past, balloons sealed with these disks have found disfavor because of slow leakage, especially when filled with helium gas. Also, these disks do not pass the standard safety test for small children as previously cited and are themselves an ingestion hazard.

Besides the high risk of the elastic twisted neck of the toy balloon fluid leakage under lessened tension resulting in premature deflation of the inflated toy balloon owing to the relatively large slots, these prior art devices are relatively heavy and costly particularly because they are molded.

Another conventional toy balloon closure device is a plastic molded cup-shaped device, as for example US Pat. No. D329,261 that also uses slots for both inserting and retaining the neck of an inflated toy balloon. The molded cup is heavy, cumbersome to use and does not impart a 180-degree bend around a relatively sharp well defined edge.

Yet another existing closure device is the applicant's Balloon Valve Assembly disclosed in U.S. Pat. No. 5,496,203, (Murray). Although the Murray valve passes the safety test for all ages and is half the weight of other balloon valves, and it too is molded and is about three times heavier and three times more costly to produce when compared with many of the various embodiments of the closure and sealing device of the present invention as described below in this application.

There is therefore a need for a safe, relatively inexpensive, lightweight and easy to make toy balloon closure and sealing device that additionally has easy to understand and/or intuitive instructions, and that does not use large slots which are susceptible to allowing untensioning of the elastic twisted necks of the inflated toy balloons, and/or allowing the premature deflation of the inflated toy balloon.

Summary of the Invention.

In accordance with one aspect of the present invention, there is provided a toy balloon closure and sealing device including (a) a generally substantially flat member having a convoluted perimeter including a first end, a second end opposite the first end, a first side edge and a second side edge opposite the first side edge, (b) a balloon neck receiving aperture formed through the generally substantially flat member and between the first end and the second end, said balloon neck receiving aperture being located generally central to the convoluted perimeter, (c) passage means for inserting a balloon neck from the first end into the balloon neck receiving aperture, and (d) at least one stretched balloon neck retaining means formed on at least one of the second end, the first side edge and the second side edge, for creating at least one sharp bend and seal in the stretched balloon neck from the balloon neck receiving aperture for reinsertion through the passage means

and the balloon neck receiving aperture; thereby effectively closing and sealing the balloon.

In accordance with another aspect of the present invention, any toy balloon closure and sealing device including a structured member having balloon neck insertion and retaining devices, also has a safety device for making it safe for children to use without a significant risk of injury. In one embodiment, the safety device is a tail-portion extending from a point on a perimeter of the structured member for making the structured member have a size that satisfies the standard safety test for small parts. In another embodiment, the safety device included a repulsive taste agent applied to the structured member for making it significantly and instantly unpalatable to human taste.

Brief Description of the Drawings

In the detailed description of the invention presented below, reference is made to the drawings, in which:

Fig. 1 is an illustration of an inflated latex toy balloon showing a stretched twisted balloon neck for closure and sealing with the closure and sealing device of the present invention;

Fig. 2 is an illustration of a first embodiment of the closure and sealing device of the present invention including a tail-portion to assure a device size commensurate with passage of the standard safety test for small parts;

Fig. 3A is an illustration of a second embodiment of the closure and sealing device of the present invention without the tail portion;

Fig. 3B illustrates the use of the second embodiment of the closure and sealing device of the present invention showing the balloon neck wrapped around a neck retaining means and repulsive taste area;

Fig. 4 illustrates a third embodiment of the sealing device of the present invention showing installation of a tether before wrapping the balloon neck as described in Fig. 3A;

Fig. 5 illustrates a fourth embodiment of the closure and sealing device of the present invention showing an associated rubber band, and the balloon neck wrapped around another neck retaining means on an edge of the convoluted perimeter of the device;

Fig. 6a shows a perspective view of plural balloon assemblies as in Fig. 3B, attached to a fixed tether line that includes a resilient link;

Fig. 6b illustrates a loop formed in the tether line employed to secure the balloon assemblies shown in Fig. 6a;

Fig. 7 is an illustration of a prior art as commercially available toy balloon closure disk;

Fig. 8 is an illustration of prior art device of Fig. 7 showing the balloon neck in a suggested wrapping pattern;

Fig. 9 illustrates a fifth embodiment of the closure and sealing device of the present invention;

Fig. 10 is an illustration of a portion of a stamped out exemplary frangible strip of a number of exemplary embodiments of the closure and sealing device of the present invention;

Fig. 11A illustrates a sixth embodiment of the present invention showing a symmetrical version of the closure and sealing device having two neck-receiving apertures:

Fig. 11B illustrates the sixth embodiment of the present invention showing an alternate method for removably securing the device of the present embodiment to a fixed tether line; and

Fig. 12 is a perspective exploded view of the sealing device showing an area of repulsive taste and a preferred method of wrapping of a toy balloon neck around the substantially flat member.

Detailed Description of the Invention.

With reference now to Figs. 1-12, like reference numerals refer to the same or like elements. Fig. 1 is an illustration of an inflated latex toy balloon 30,

sometimes referenced as toy balloon 30, showing balloon body 32 and a stretched twisted neck 34 that needs to be closed and sealed using a closure device, for example, the closure and sealing device 50 of the present invention. As shown, the neck 34 of the inflated latex toy balloon 30 can be seen as including neck portions 36, 37, and 38, which are each respectively further and further away from the balloon body 32, and terminating in neck rim 40. The neck portions are relevant for instructing how to close and seal the neck using a balloon closure and sealing device such as that of the present invention.

Some latex toy balloons of course have relatively longer necks than others, and balloon thickness also varies with balloon size and from variety to variety, which facts together directly affect how easily the neck can be stretched and twisted as shown, and importantly how strong a tendency such a stretched and twisted neck, due to loosing tension, will have towards unraveling or towards escaping from any slot or aperture through which it is passed or inserted. It has been found that stretched and twisted balloon neck diameters vary from about 0.028 inches for small "water balloons" to about 0.108 inches for 11 and 12-inch size balloons.

Referring now to Fig. 2, it is an illustration of a first embodiment of the closure and sealing device 50. Shown are various parts of this first embodiment of the balloon closure and sealing device 50, or simply device 50. As illustrated, the device 50 of the first embodiment, as well as of the rest of the other embodiments illustrated below, is a substantially flat member 51, made for example of a semi-rigid plastic material of any color preferably clear, transparent or translucent plastic material to take on the color of the balloon and thereby appear inconspicuous. Alternately, device 50 may be made of a biodegradable material as for example treated cardboard.

As shown in Fig. 2 flat member 51 has a convoluted perimeter 53 consisting of a first end 52, an opposite second end 54, a first side edge 56, and a second and opposite side edge 58. Additionally, the flat member 51 includes a balloon neck-receiving aperture 60 and a balloon neck passage means 63

communicating with the balloon neck-receiving aperture 60. The balloon neck-receiving aperture 60 may be any shape and size that is conducive to positioning stretched balloon neck 34 and particularly neck portion 38 out of alignment with neck passage means 63. This is further explained in Fig 3 description.

A shown in Fig. 2, flat member 51 optionally may include a tail portion 80, which may be attached to or extend from a point on the perimeter 53 of the sealing device 50. The tail portion 80 may be so attached by any suitable means, including solvent welding for example, or it may be made integral with one of, the second and opposite end 54 (as shown), first side edge 56, or second side edge 58, and terminating in tail end 82. As further shown, the tail portion 80 may also include one or more tail-receiving slots 84. Furthermore, tail portion 80 includes a tail-first-side edge 96 and a tail-second-side edge 88 which may taper toward tail end 82 for the purpose of being inserted into a force fit association with tail-receiving slots 84 of similarly configured sealing devices 50 having tail-portions 80. In accordance with an aspect of the present invention, tail-portion 80 is sized in length so that device 50 will pass the safety test for children of all ages, and its width is sized so that it can be inserted and wedged into other pre-drilled holes, for example; the pre-drilled holes in the perforated material commonly known as "pegboard." This thus allows a person to display a multitude of balloons in a user-desired pattern on pegboards.

Although the tail portion 80 has been disclosed in combination with particular exemplary features of the generally flat member 51, it is understood that the inclusion of tail portion 80 (Fig. 2), is equally intended to function as a safety device with any of the embodiments of the closure and sealing devices of the present invention as well as other toy balloon sealing devices having a structured member 51.

Fig. 3A is an illustration of a second embodiment of the closure and sealing device of the present invention without the tail portion. Figs. 2 and 3A further illustrate that a stretched neck retaining recess 64 may be incorporated into second end 54 for the purpose of retaining a stretched balloon neck 34 (not shown).

Wrapping of the stretched balloon neck to close and seal the inflated balloon will be apparent from viewing Fig. 12 and studying Figs. 3B and 5.

As shown in Figs. 3A-6, individual sealing devices 50, each suitable for its purpose, need only to be about 7/8 inch square. This size does not pass the standardized choke test for children of all ages mentioned previously. To make each safe, an embodiment of this invention includes a repulsive taste agent 55 applied by any suitable means to all or a portion of flat member 51 as indicated by dash line area 100, so as to make any attempt at ingestion and possible injury so repugnant to the users taste that it would not be ingested. Tail portion 80 could be added for increased safety.

With or without tail-portion 80, a second embodiment of a safety device would be a repulsive taste agent 55 area best seen in FIG, 12. The repulsive taste agent 55 formulation should include an obnoxious-tasting compound such as a bittering agent, for example, Denatonium Benzoate, that is applied to the closure and sealing device 50 in a suitable manner so that a child, person or animal, upon placing the device 50 into his/her or its mouth would immediately and instantly likely spit it out because of the unpleasant taste. The repulsive taste agent 55 can be applied by coating or impregnating the entire or just a strip of the, structured member or generally flat member, 51 directly. It can also be applied by similarly coating or impregnating an adhesive label with the repulsive taste agent 55, and then applying such label to generally flat member of the closure and sealing device as suggested in Fig. 12 description. It has been observed that the neck of the balloon, and many times the entire balloon, will remain attached to the sealing device if the balloon ruptures thus making that portion of the balloon, that remains, unpalatable and thus safe. As just described, the repulsive taste agent could be applied to or incorporated with any closure and sealing device to make it less likely to be ingested and therefore safer for the user.

Fig. 3B illustrates the use of a second embodiment of the closure and sealing device 50 of the present invention showing the stretched balloon neck 34

wrapped around the second end 54 of the device. The balloon neck passage means 63 as shown is comprised of lead-in entry notch 61 and a narrow slot 62 (having a width less than 0.030 inches for improving neck capture and preventing unraveling risks). Alternatively, balloon neck passage means 63 may include a slit 162, as shown in Fig. 9. Shown at rest in Fig. 9 slit 162 has no width since no material had been removed. Because the material of flat member 51 is semi-flexible, material on each side of slit 162 will flex in response to, and in an amount needed to allow passage of balloon neck 34 or stretched portions thereof. This flexing is also true for slot 62 since many larger balloons have a neck diameter, as previously stated, larger than slot 62. After passage of balloon neck 34 into the neck-receiving aperture 60, slit 162 will return to having no width and thereby effectively capture the toy balloon neck and effect sealing the balloon after the balloon neck has made at least 180 degrees of turn as further described below.

As best seen in Fig. 10, flat member 51 may also include at least one neck retaining means 64 comprising elements 64a, 72, 74, 76, 78, on at least one of the second and opposite end 54, the first side edge 56, and the second and opposite side edge 58, for preventing and limiting lateral travel of a wrapped portion of the balloon neck therealong. In the first embodiment, the neck retaining means 64 comprises a notch 64a formed into the second and opposite end 54. The at least one stretched neck retaining means 64 is located symmetrically relative to the balloon neck receiving aperture 60. Further, the balloon neck-receiving aperture 60 may be formed closer to the first end 52 than to said second end 54 for making insertion and retention of the neck easier.

It has been found that a straight opposite end 54, (shown in Fig. 2 and Fig. 4 without notch 64a), of sufficient length to prevent the stretched balloon neck from slipping or sliding around an adjacent corner works equally well in providing the 180 degree turn in the stretched and twisted balloon neck 34 needed to reliably seal the balloon. A disadvantage of omitting at least one stretched neck retaining means is removal of a visual cueing to the user of the neck-wrapping path to be followed.

Note that the devices shown in Figs. 9 and 10 provide strong visual cues of stretched neck entry points. Preferably, the twisted neck turn should occur over at least one hard edge and where there is not more than about .045 inches of material thickness between twisted portions in contrast to two 90 degree turns occurring further apart, for example a quarter of an inch apart.

As shown in Figs. 2-3B, flat member 51 in each of the embodiments further has a first substantially flat face 66 and a second substantially flat and opposite face 68. Both faces are mirror images of each other therefore references to a particular side or edge are interchangeable, and as such, use of the device 50 is not face dependent, thereby allowing for ease of use instructions. In each of the embodiments, the balloon neck-receiving aperture 60 for example is large enough to snugly contain three passes of the stretched and twisted neck 34 of a large size toy balloon 30. The wall of the aperture 60 towards the second end 54 of the flat member 51 may include a tongue portion 70 protruding into neck receiving aperture 60 itself for the purpose of positioning two different portions of the twisted balloon neck 34 given a two passes insertion of the balloon neck into the aperture. This causes misalignment of each of the two passes within aperture 60 with the neck passage means 63 to that the stretched neck portion 34 will remain under tension.

Fig. 3B further illustrates a near final stage of instructions for closing and sealing an inflated balloon 32 using a second embodiment of the device 50 of the present invention that is similar to Fig. 2, but without tail portion 80. As illustrated, the inflated balloon body 32 is positioned adjacent the second face 68 and hence behind device 50. The stretched and twisted balloon neck 34, having been traversed or passed through the lead-in notch 61 and the slot 62 or slit 162 of the neck passage means 63, is received and held within the neck-receiving aperture 60.

As best seen in Fig. 3B, in a two pass insertion of the neck 34, the tongue 70 acts to contain and guide twisted neck portion 36, (nearest to balloon body 32), to either side of tongue 70, so that balloon neck portion 38, (near balloon rim 40), will position itself off of the centerline of neck passage means 63 and thereby

reduce the risk of the neck portion 38 escaping from the receiving aperture 60, via neck passage means 63, as well as reduce the risk of such neck loosing tension or unraveling (untwisting), and hence resulting in premature deflation of the balloon body 32.

Fig. 4 illustrates a third embodiment of the sealing device of the present invention showing installation of a tether 156, without the need for tying, prior to installing the balloon neck (not shown), as described in Fig. 3B. The tether assembly keeps the balloon from floating away when filled with helium for example. Fig. 4 also Illustrates a preferred method for assembling a ribbon tether 156 consisting of free end 152, and supply end 154 where ribbon 156 is wrapped at least once around neck retaining means 64a and at least twice through aperture 60 as shown in Fig. 4. The tether 156 is then impinged and captured by the balloon neck installation as described for Fig. 3B. The user is able to select ribbon color and use any desired tether length. The tether may be a ribbon or a string.

Fig. 5 illustrates a fourth embodiment of the closure and sealing device 50 of the present invention showing a stretched balloon neck 34 wrapped around a side edge 56 of device 50. Shown also is a method of associating a rubber band 158 with the sealing device 50 and inflated toy balloon 30 for the purpose of turning the inflated balloon into a punch ball, and; in a similar manner, alternate means of attaching a tether to keep a helium inflated balloon 30 from floating away will be described.

Fig. 5 shows a near final stage of instructions for closing and sealing an inflated balloon 32 using a fourth embodiment of the device 50 of the present invention. As illustrated, the inflated balloon body 32 is positioned adjacent the second face 68 and hence behind device 50. The stretched and twisted balloon neck 34, having been traversed or passed through the V-shaped lead-in notch 61 and neck passage means 63, into the neck-receiving aperture 60. As shown in Fig. 5, the stretched neck portion 34 is wrapped around second side edge 56 neck retaining means 72 and again through neck passage means 63 and into the neck-receiving

aperture 60 for the second time. Note, a user might have chosen either one of two neck retaining means 72, or 74 of the convoluted periphery or perimeter 53 shown in Fig. 5. Note also that tension on balloon neck portion 38, (near balloon rim 40), will be directed ninety degrees off of the centerline of neck passage means 63 and thereby reduce the risk of the neck portion 38 escaping from the receiving aperture 60, via neck passage means 63, as well as reduce the risk of such neck loosing tension or unraveling (untwisting), and hence resulting in premature deflation of the balloon body 32.

To assemble a punch ball, a loop 159 is formed in rubber band 158. The loop is slid between sealing device 50 and the inflated balloon 30, pinched together as shown by arrows 210 and 212 and pulled in direction of arrow 215 to snug loop 159 around balloon neck portion 36 (not seen) and then drawn upwards into and through neck passage means 63, into neck retaining aperture 60 which completes the installation. It has been found that a string or ribbon may be substituted for rubber band 158 to cause balloon neck portion 36 (not shown) to stretch and return the inflated toy balloon 30 back toward the user in a manner very similar to using rubber band 158 after the user strikes the balloon with a punching action.

Fig. 5 also serves to illustrate an alternate method, similar to installing the rubber band, for releasably attaching a tether to inflated balloon 30 after it has been closed and sealed by sealing device 50 without the need to tie a knot, for the purpose of exercising control over the inflated balloon 30, especially if filled with helium gas. It has been found that a single tether loop installed in a manner represented by rubber band 159 works marginally well, however, wrapping the tether twice around the balloon neck before passing into aperture 60 provides additional security to prevent the tether's release. Note that neck rim 40, is shown moved away from the normal at-rest position in order to more clearly show the mechanics of the assembly in Fig. 5.

Fig. 6a shows a perspective view of plural balloon assemblies of the present invention removably secured to a tether line 300 and attached at ends 302 and 304. A substantially non resilient tether line 300 includes resilient means 350 for providing slack so that a loop 310 (best seen in Fig. 6b) can be formed in tether line 300 by applying tension in the direction of arrow 315 so that loop 310 encircles balloon neck portion 36 (not seen) between sealing device 50 and inflated balloon 30. Releasing tension in the line 300 tightens loop 310 and thereby secures the balloon device 50 to the tether line 300. As an alternative to providing the resilient tether line, daisy chaining a plurality of rubber bands will also cause balloon assemblies 30 to proportionally space themselves in response to the degree of stretching of the tether line.

Fig. 7 illustrates a commercially obtained prior art balloon sealing disk 450 such as the disk distributed by Premium Balloon Accessories, Inc., under the trade name of SAFETITE® Disk, based upon US Pat. No. D359,229, is Illustrated by Fig. 7 and its use is illustrated in Fig. 8. As shown, it comprises a molded and relatively-rigid flat member 451, having two round neck receiving apertures 460 and 461, and two significant size slots 467 (as compared for example to slit 162 of the present invention) and 463 each being about .040 inches wide and not designed to encourage flexing of material adjacent to the slot (as evidenced by a reinforced periphery around aperture 460) to permit balloon neck passage.

Aperture 460 is said to be centrally located with respect to member 451. Instructions printed elsewhere direct a user to first insert the balloon neck into longer of the two slots (467 and 463) into the aperture 460, then through the shorter slot (463) into the second aperture 461, and then through the longer slot (467) a second time and into the aperture 460.

Fig. 8 is an illustration of prior art device of Fig. 7 showing the balloon neck in a suggested wrapping pattern. Following such instructions is depicted in Fig 8, where it was found that the balloon neck portions 37, 38 needed considerable stretching in order to permit passage a second time through the slot 467, partially due

to the distance between second apertures 461 and the entry point for slot 467. Also It was noted, especially with larger size balloons, that the neck portion 36 completely filled the aperture 460, and therefore neck portion 37, 38, was forced to remain within neck passage slot 467 where it ordinarily was likely to unravel and escape especially since the tension exerted on neck portions 37, 38 is in direct line with neck entry slot 467.

The excessive stretching necessary to gain entry into and through the slot 467 for the second time, thus resulting in a length of portion 37 and all of portion 38 that was even more likely to unravel (untwist) immediately upon the release of tension from stretching. This thereby increases the likelihood of escape via neck passage slot 467, and or slippage and a reduction of tension in the wrapped balloon neck portion 36 and hence in premature deflation of the inflated balloon 30. If the user mistakenly chooses the shorter slot (463), to start and end with, the likelihood of premature deflation is virtually assured due to unraveling given a much shortened escape route (shorter slot 463) that is in alignment with neck passage slot 467.

Fig. 9 is an illustration of a fifth embodiment of the closure and sealing device 50 of the present invention. The fifth embodiment is similar to the embodiment of Fig. 5, except that the ends 52, 54, and the side edges 56, 58 are semi-circular rather than straight. In another comparison, the device of Fig. 9 is similar to that of Fig. 8, but it represents an improved structural arrangement and an improvement (as described below) over prior art shown in Fig. 8.

Note the greater size and lateral width of aperture 60 of the fifth embodiment permits easier flexing of material adjacent to neck entry means 63 and therefore entry means can be narrower to a point where it is merely a slit 162 having no material removed and hence no slot width at all. Balloon neck passage means 63 is designed to flex, due to wider lead in notch 61 and, to permit balloon neck entry. Note that the device of Fig. 9 has neck-retaining means 72 and 74 arranged so that the use of either of them, as determined by user's preference, will direct the balloon

neck tension forces in a direction approximately 90 degrees to the axis of neck passage means 63.

Also shown is a reconfigured neck-retaining aperture 60 that is relatively more conducive to retaining two or more portions of the balloon neck (e.g. portions 36 and 38, not shown). In this particular use, considerably less stretching of the balloon neck 34 would be required as compared to the stretching shown in Fig. 8. The structure of the embodiment of Fig. 9 allows a user to easily locate neck entry notch 63, and the option to use either neck retaining means, in the convoluted periphery, as might be preferred.

A comparison of the device of Fig. 9 with the prior art devices of Figs. 7 and 8 showed that in the equally short escape route element 162 shown in Fig 9; tension on neck portion 38 is directed in a direction that is (not parallel or directly in line with) but is at approximately 90 degrees to slit, slot, 162, 62 of neck passage means 63. Because of this direction of action, the element 62 can be a relatively narrow slot, for example less than .040 inches or about .030 inches, as opposed to being a slit 162. This clearly reduces the likelihood of the neck portion 38 escaping by sliding backwardly through the slit 162 or slot 62. As a result, this reduces the risk of the neck portion 38 unraveling and causing premature deflation.

Fig. 10 is an illustration of a stamped out exemplary frangible strip 351 of a number of the various embodiments of the closure and sealing device 50 of the present invention, whereby individual closure devices 50 can be separated from each other by breaking the connection 352 in the convoluted periphery or perimeter 53 between individual closures. Each strip can be separated into individual devices by breaking a connection between adjacent devices forming the strip. Shown also is a second end notch 64a, a side edge notch 72 in combination with one tab protrusion 78. The neck passage means 63 includes a slit 162, and each have a first side edge 56, including neck retaining means 72 in the form of a notch or half-rectangle, as well as the second side edge 58 including neck retaining means 78, in the form of a tab or

protrusion. This gives the user a choice of wrapping patterns to suite a user's preference.

Fig. 11A illustrates a sixth embodiment of the present invention showing a symmetrical version of the closure and sealing device having two neck-receiving apertures. The two apertures 60 and 160 are the same size and shape, as are the lead in notches 61. This eliminates any user confusion as to where to first insert the twisted balloon neck 34, (not shown) since both the first end 52 and the second end 54 are symmetrical relative to the neck receiving aperture 60, and the twisted neck could be inserted into the aperture 60 starting with either end and have exactly the same sealing closure result.

Thus Fig. 11B further illustrates a completed, closed, sealed and tethered toy balloon assembly 151 consisting of the inflated balloon 30, the device 50 of the present invention, and the ribbon tether 300, all being assembled without tying knots.

Fig. 11A also illustrates an improvement over the prior art device shown in Fig. 7 in at least three distinct ways. First, confusion is avoided since the user does not have to make a choice regarding which neck passage means 63 to use to insert the twisted balloon neck (not shown) since device 50 is symmetrical. Second, less stretching of the balloon neck 34 (not shown) is required since both balloon neck-receiving apertures are symmetrically located relative to ends 52 and 54 of device 50. Thirdly, the inclusion of tongue 70 (not shown) within apertures 60 and 160 keeps stretched neck portions 36, and 38 out of alignment with neck passage means 63. The last portion 38 (not shown) of the twisted balloon neck would require less stretching than that shown in Fig. 8 and therefore be less prone to unraveling and cause premature balloon deflation.

Fourthly, wrapping the twisted balloon neck may be terminated at half revolution intervals compared to full revolution intervals inherent for configurations previously described in Fig. 3B and 5 for example. Benefits result from half revolution terminations; first, balloon neck slack, especially in neck portion 38, can be

accommodated by wrapping of an additional half-revolution, to take up slack and by so doing further reduces the risk of premature deflation. Second, an additional 180-degree turn is provided which results in additionally reducing the likelihood of premature deflation. Third, an aesthetic benefit, is that by ending at a half revolution, the neck rim will be concealed since it will lie between the balloon body 32 and device 50. A fourth benefit is that the inflated balloon 32 and assembly 50 may be removable secured to a fixed line, such as tether line 300 as shown in Fig. 6a without the need to form the loop shown in Fig. 6b. Directing attention to Fig. 11B, sealing device 50 is placed behind fixed tether line 300, and balloon neck portion 38 is stretched in direction of arrow 202 and brought into aperture 160 thereby slideably impinging fixed tether line 300 between balloon neck portions 36 and 38.

The sealed balloon assembly is easily removed from the line 300 by reversing the last step, whereupon the sealed balloon may be presented to a departing youngster for example

Fig. 12 is a perspective exploded view of sealing device 50 showing an area of repulsive taste agent 55 and a preferred method of wrapping stretched neck portions 36, 37 and 38 one revolution around flat member 51 passing at least twice through neck-receiving aperture 60 to effectively close and seal inflated toy balloon 30.

The repulsive taste agent 55 safety coating can be applied as suggested by dashed lines in Fig. 12 or to any part of flat member 51, including the periphery or portions thereof by any suitable means such as dobbing, printing with inks containing the repulsive taste agent 55 agent, or an adhesive label treated with a repugnant taste agent.

As can be seen, there has been provided a toy balloon closure and sealing device that includes (a) a generally flat member having a first end, a second end opposite the first end, a first side edge and a second side edge opposite the first side edge, (b) a balloon neck receiving aperture formed through the generally flat member and between the first end and the second end, (c) passage for inserting a

balloon neck from the first end into the balloon neck receiving aperture, and (d) at least one stretched neck retaining means formed on at least one of the second end, the first side edge and the second side edge, for creating at least one sharp bend and seal in a balloon neck being stretched from the balloon neck receiving aperture for reinsertion through one of the passage and the balloon neck receiving aperture in the generally flat member; thereby effectively closing and sealing the stretched balloon neck without tying and without a risk of the balloon neck unraveling and causing premature balloon deflation.

While preferred embodiments of the invention have been illustrated and described, and while other alterations will be apparent, it should be understood that other variations will become apparent to one skilled in the art without departing from the principals herein. Accordingly, the invention is not to be limited to the exact configurations illustrated in the drawings, but is intended to set forth the nature of the invention: